

C305:

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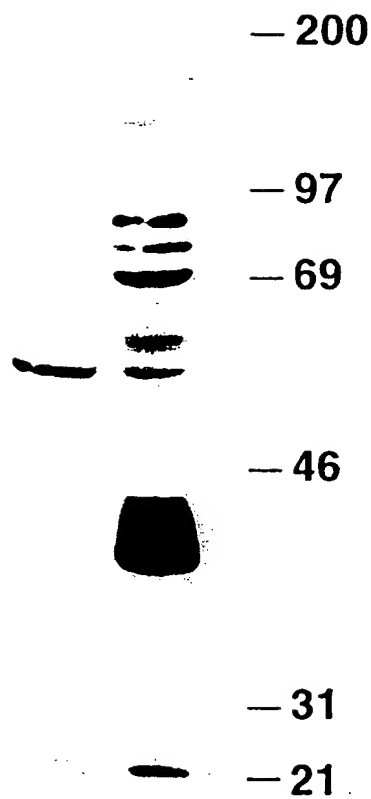


FIG. 1A

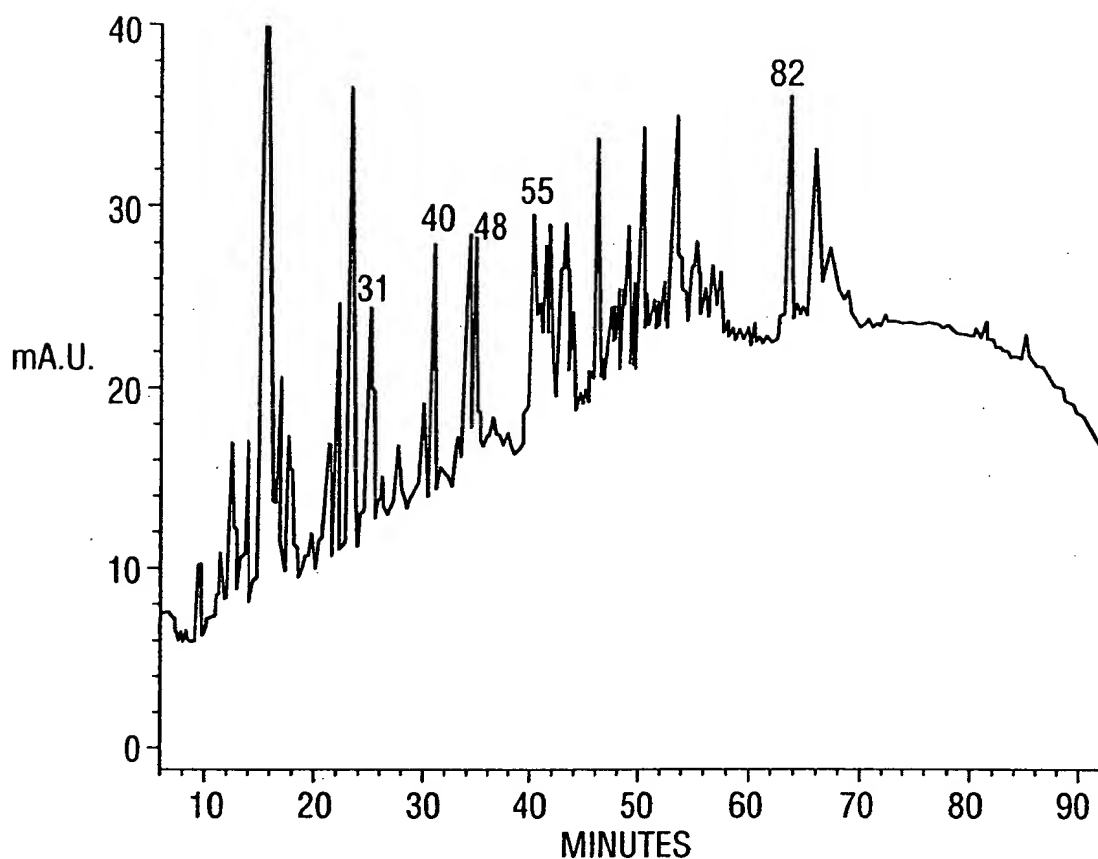


FIG. 1B

Expt	Peak	Mass	Sequence	Source
1	40	1721.9	x x v N V S Q E L H P x A A k	LAT
1	82	1840.0	S E V L G W D P D S L A D Y F K	SLP-76
2	31	n.d.	S I F T R	SLP-76
3	55	1334.8	n.d.	SLP-76
3	48	1743.3	L P G S Y D S T S S D S L Y P R	LAT
3	48	1641.6	x Y v N V	LAT

FIG. 1C

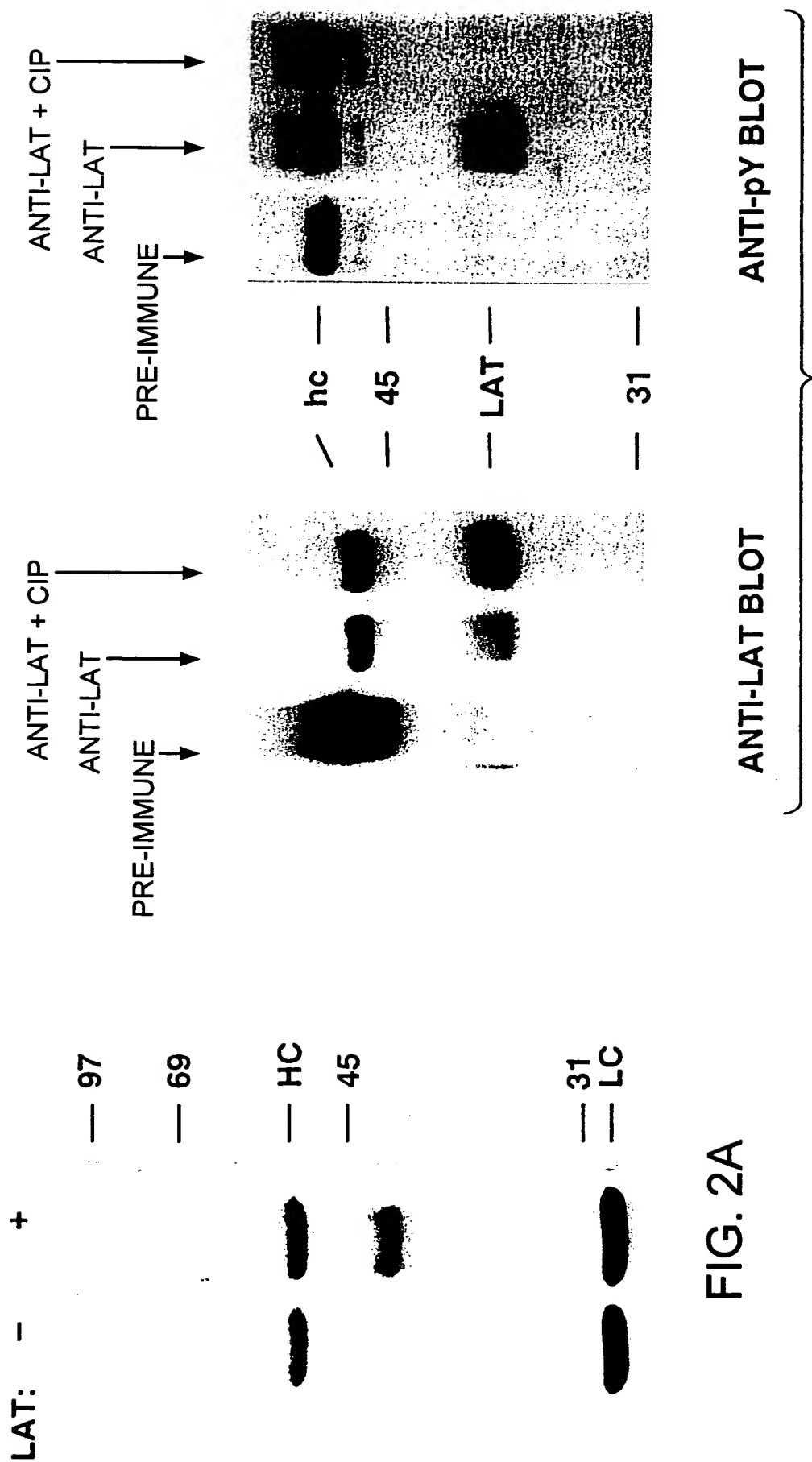


FIG. 2A

FIG. 2B

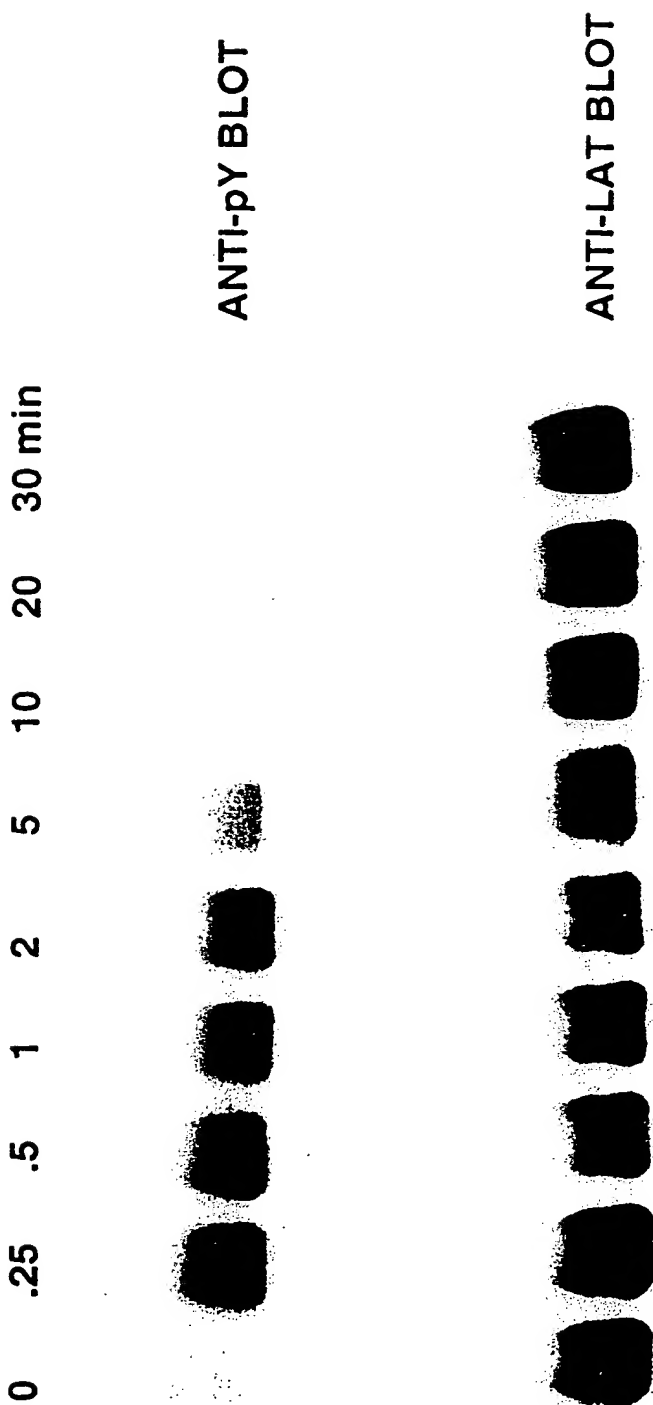


FIG. 2C

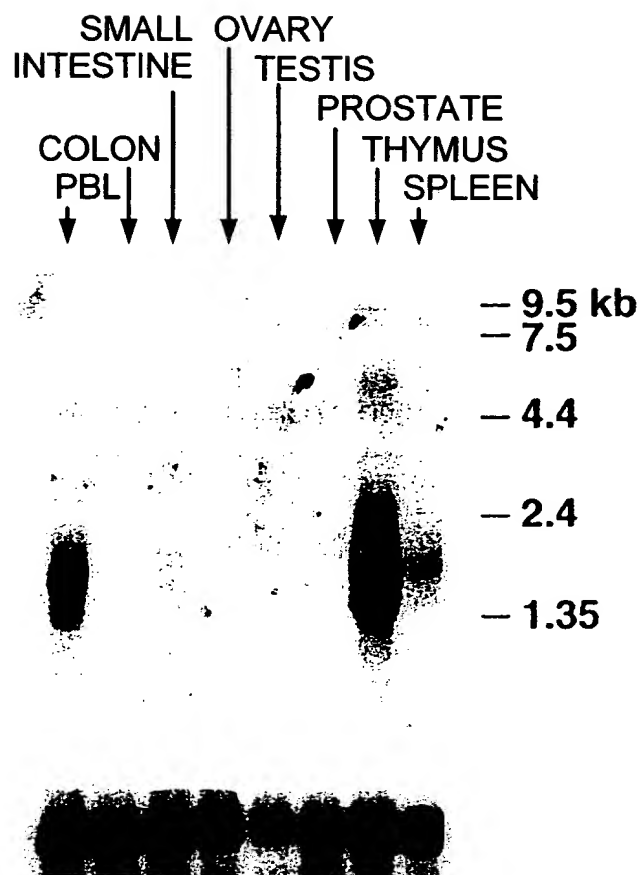


FIG. 3A

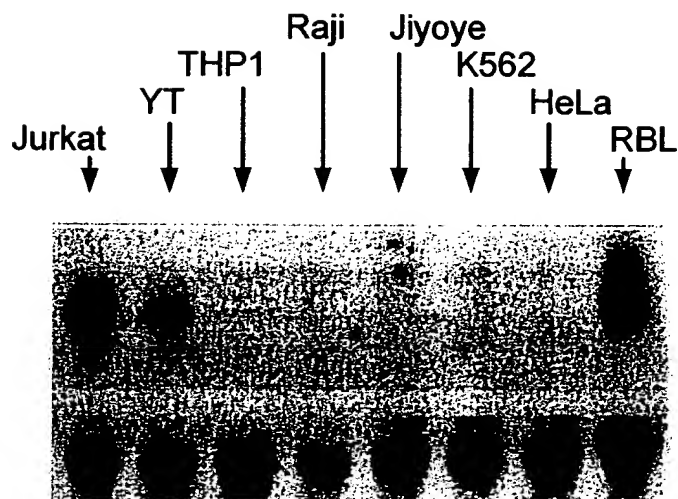


FIG. 3B

INPUT DNA:

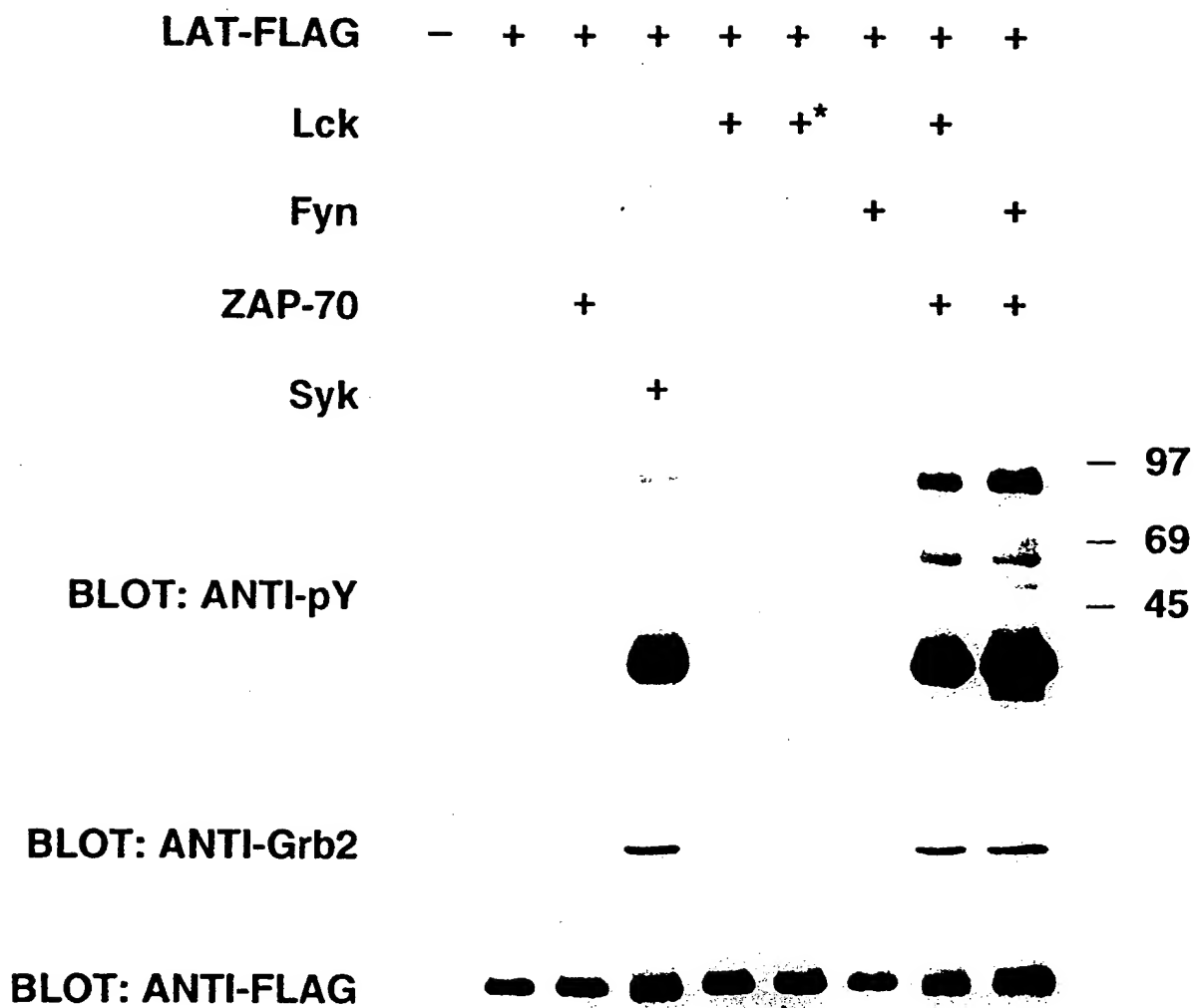
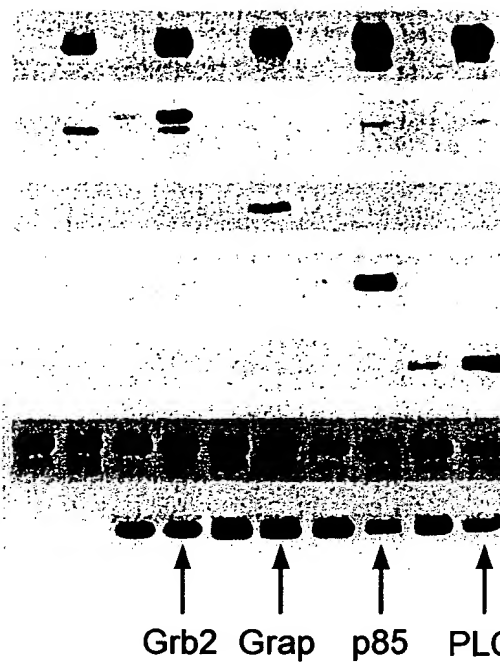


FIG. 4A

INPUT DNA:

LAT-FLAG	+	+	+	+	+	+	+	+	+	+
Lck + ZAP-70	+		+		+		+		+	
Grb2-HA		+	+							
Grap-myc				+	+					
p85-HA						+	+			
PLC- γ 1								+	+	



BLOT:
 ANTI-pY (LAT)
 ANTI-Grb2
 ANTI-myc (Grap)
 ANTI-HA (p85)
 ANTI-PLC- γ 1
 ANTI-FLAG
 Ab TO TEST
 PROTEIN

FIG. 4B

TRANSFECTION WITH Lck, ZAP-70 and LAT-FLAG PLUS:

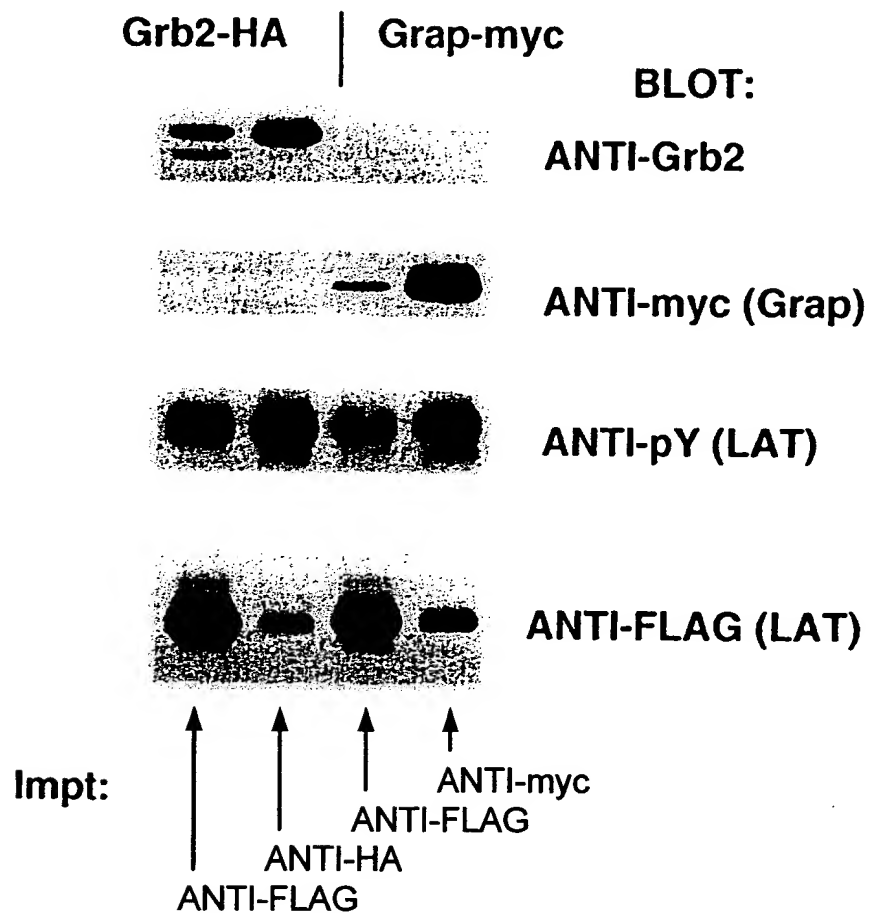


FIG. 4C

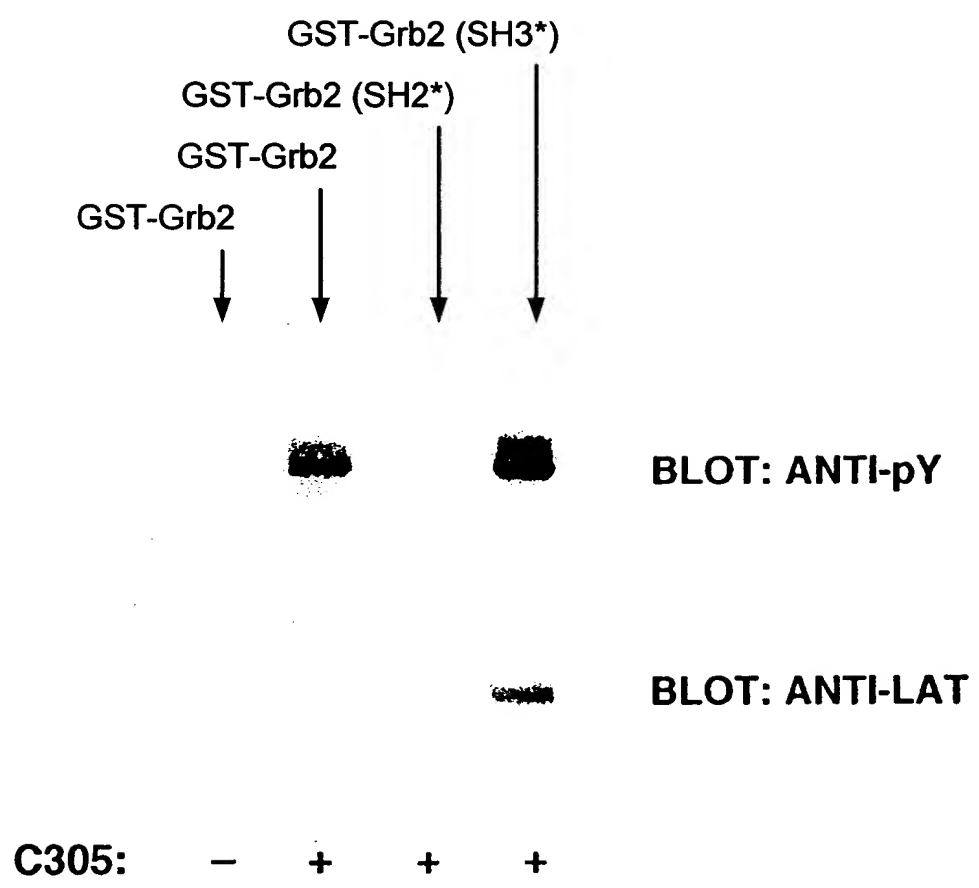


FIG. 5A

10/36

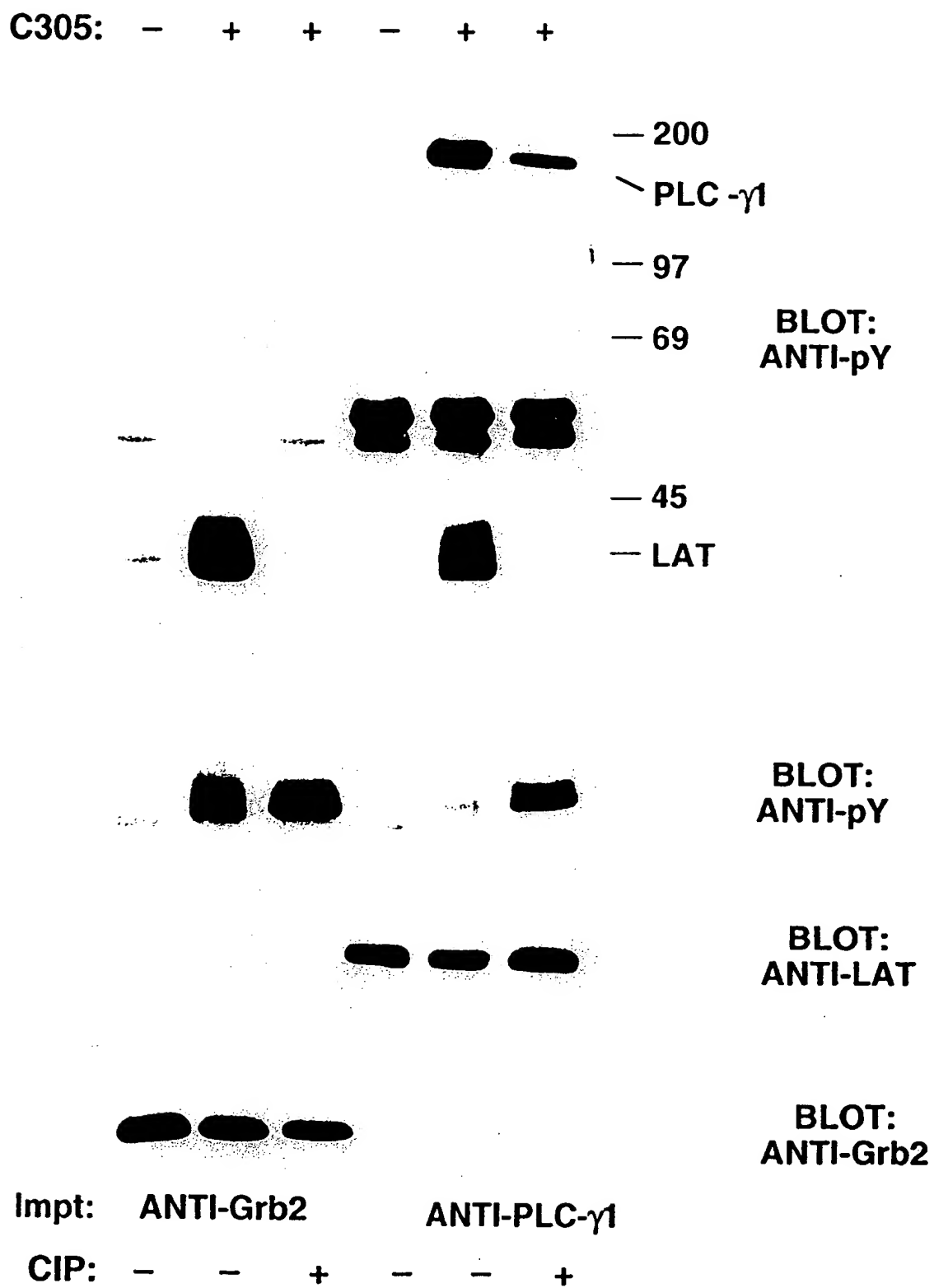
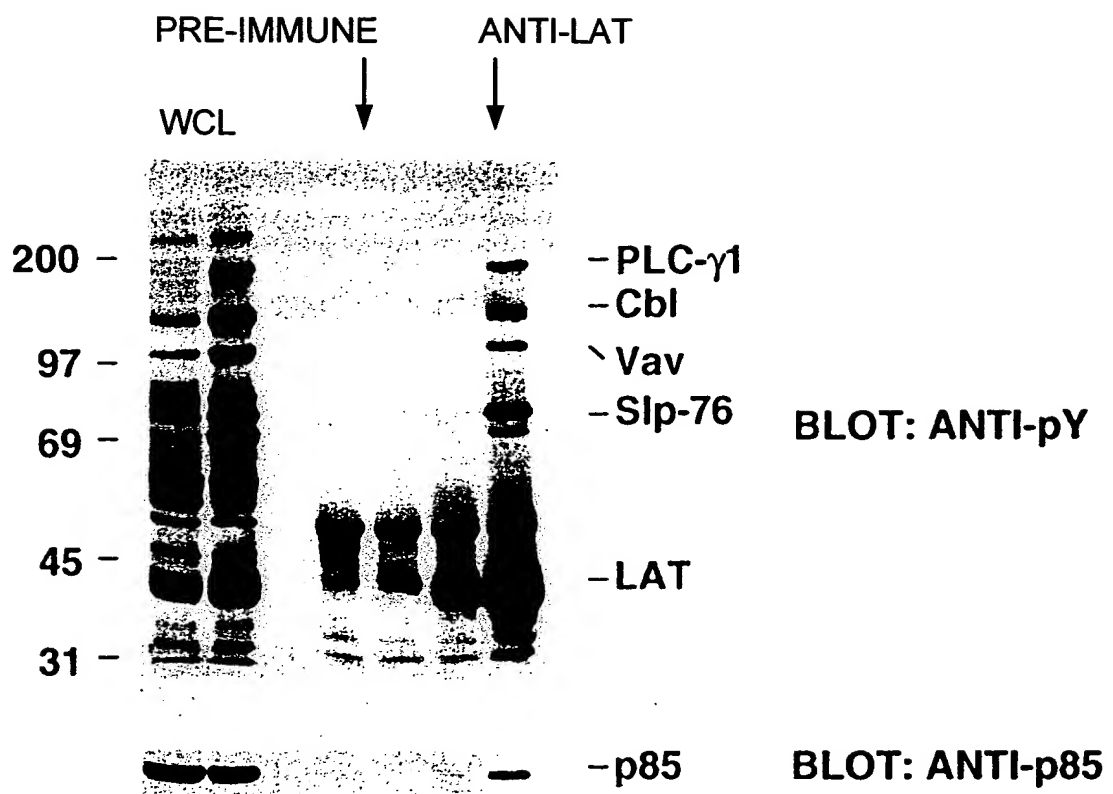


FIG. 5B



C305:

FIG. 5C

12/36

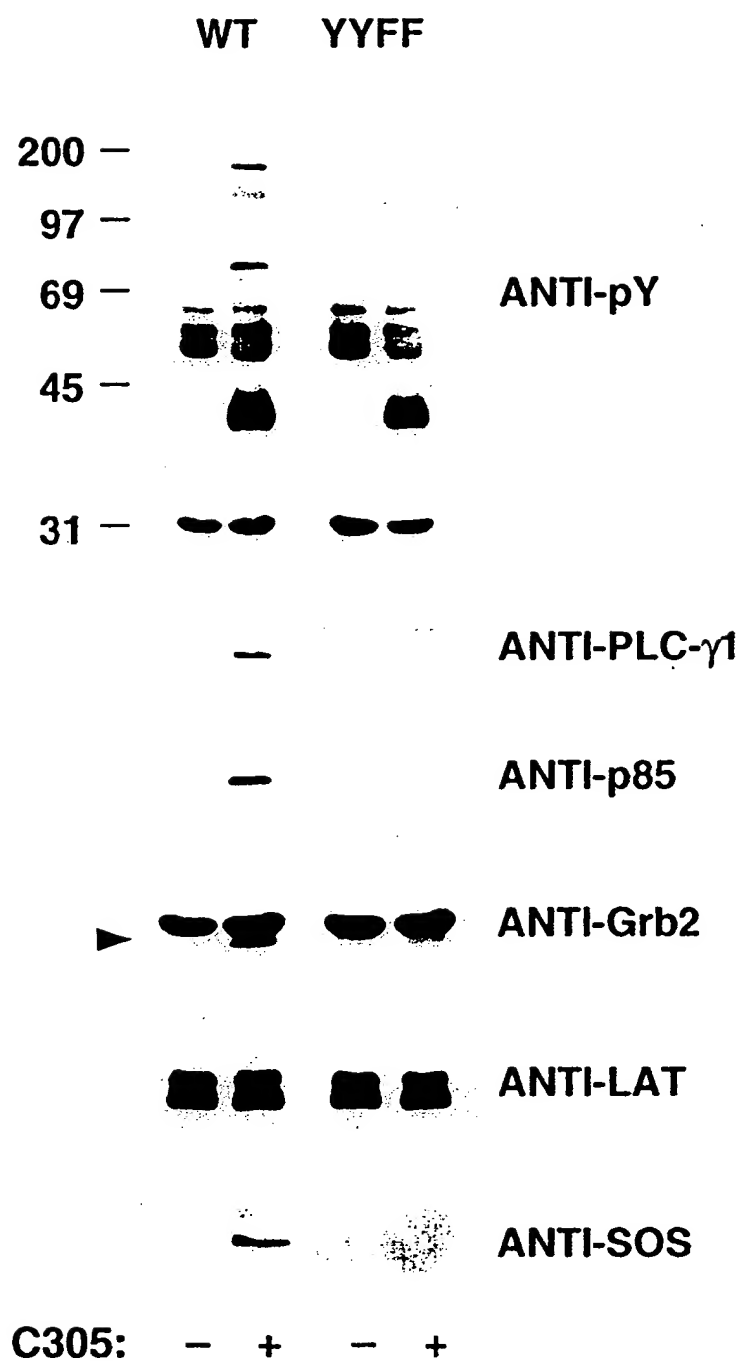


FIG. 6A



13/36

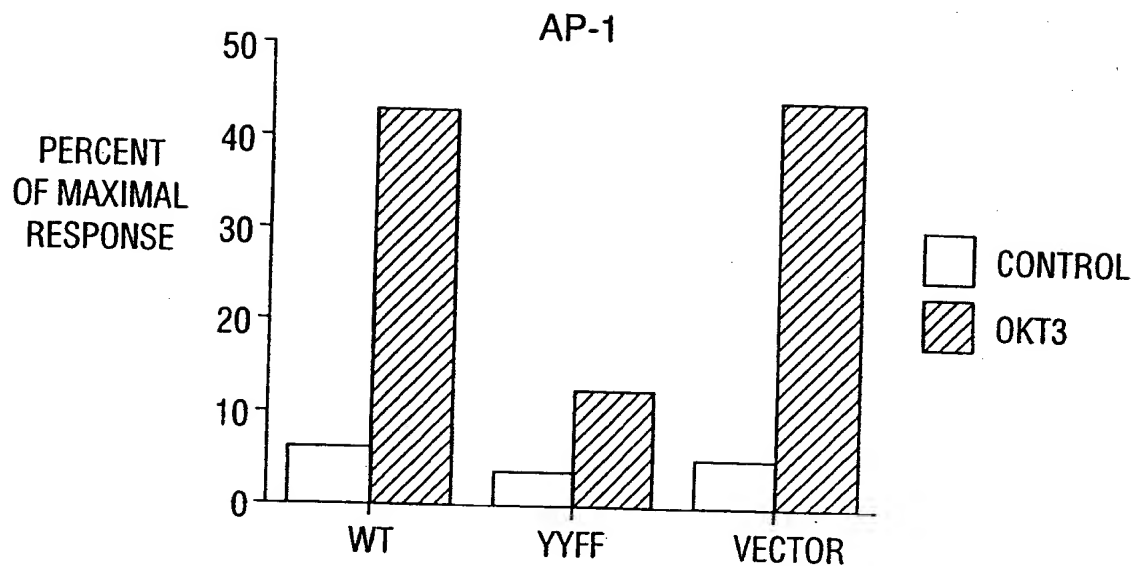


FIG. 6B

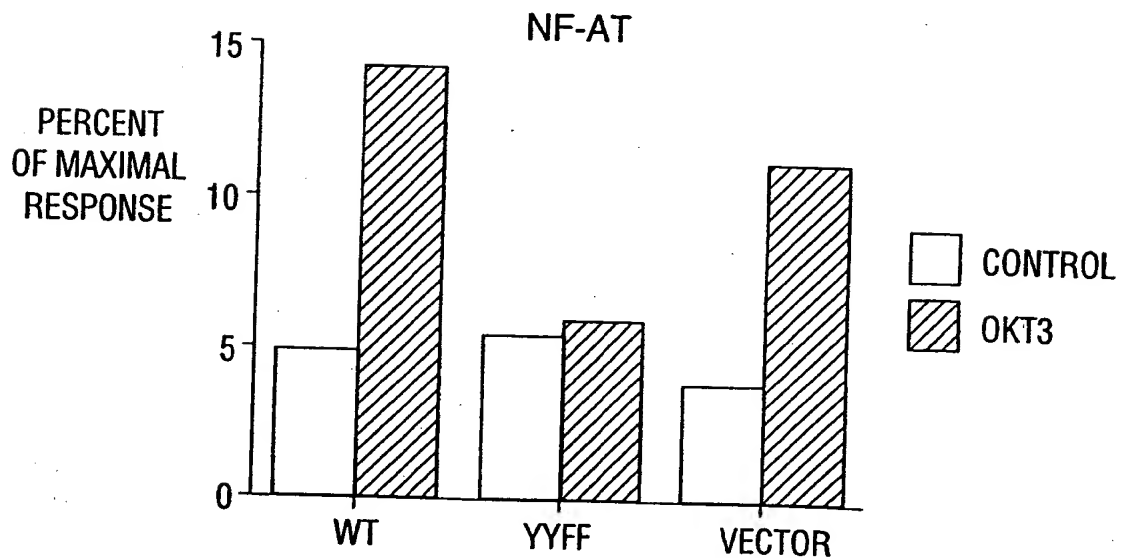


FIG. 6C



14/36

Human LAT Nucleotide Sequence (1-1060)

1 gactctgccc ttgagggggc taggggtgca gccagcctgc tccgagctcc cctgcagatg
61 gaggaggcca tcttgggtccc ctgcgtgctg gggctcctgc tgcctgccc cctggccatg
121 ttgatggcac tgtgtgtgca ctgccacaga ctgccaggct cctacgacag cacatcctca
181 gatagtgtgt atccaagggg catccagttc aaacggcctc acacggttgc cccctggcca
241 cctgcctacc cacctgtcac ctctaccca cccctgagcc agccagacct gctccccatc
301 ccaagatccc cgcagccccct tggggggctcc caccggacgc catcttcccg gcgggattct
361 gatggtgcca acagtgtggc gagctacgag aacgaggaac cagcctgtga ggatgcagat
421 gaggatgagg acgactatca caaccaggc tacttggtgg tgcctcctga cagcaccctg
481 gccactagca ctgctgcccc atcagctcct gcactcagca cccctggcat ccgagacagt
541 gccttctcca tggagtccat tgaigtatc gtgaacgttc cggagagcgg ggagagcgca
601 gaagcgtctc tggatggcag ccgggagtat gtgaatgtgt cccaggaact gcatcctgga
661 gcggctaaga ctgagcctgc cggcctgagt tcccaggagg cagaggaagt ggaggaagag
721 ggggctccag attacgagaa tctgcaggag ctgaactgag ggcctgtgga ggccgagtct
781 gtcttgggaac caggcttgcc tgggacggct gagctgggca gctggaagtg gctctggggt
841 cctcacatgg cgtcctgccc ttgctccagc ctgacaacag cctgagaaat cccccgtaa
901 ctattatca ctitgggggt cggcctgtgt ccccggaacg ctctgcacct tctgacgcag
961 cctgagaatg acctgccctg gccccagccc tactctgtgt aatagaataa aggcctgcgt
1021 gtgtctgtgg aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa

FIG. 7A



Human LAT Nucleotide Sequence (1-1460), [alternative splice variant]

1 accccatctt catctggcct tgactctgcc cttagaggggc ctaggggtgc agccagcctg
61 ctccgagctc cctgcagat ggaggaggcc atcctgggcc cctgcgtgct ggggctcctg
121 ctgctgcca tctggccat gtgatggca ctgtgtgtc actgccacag actgccaggc
181 tctacgaca gcacatcctc agatagtgtg tatccaagg gcatccagtt caaacggcct
241 cacacgggtg cccctggcc acctgectac ccacctgtca cctctaccc acccctgagc
301 cagccagacc tgcctcccat cccaagatcc ccgcagcccc ttgggggtgc ccaccggacg
361 ccatcttccc ggcgggattc tgatggtgcc aacagtgtgg cgagctacga gaacgaggtt
421 gcgtctggga tccgagggtc ccaggctggg tggggagtct ggggtccgtc ctggactagg
481 ctgacccctg tctcgttacc ccagaaacca gctgtgagg atgcagatga ggatgaggac
541 gactatcaca acccaggcta cctgggtgtg ctctctgaca gcaccccggc cactagcact
601 gctgccccat cagctcctgc actcagcacc cctggcatcc gagacagtgc ctctccatg
661 gagtccattg atgattacgt gaacgttccg gagagcgggg agagcgcaga agcgtctctg
721 gatggcagcc gggagtatgt gaatgtgtcc caggaaatgc atcctggagc ggctaagact
781 gagcctgccg cctgagttc ccaggaggca gaggaagtgg aggaagaggg ggctccagat
841 tacgagaatc tgcaggagct gaactgaggg cctgtggagg ccgagtctgt cctggaacca
901 ggcttgccctg ggacggctga gctgggcagc tggaaagtgc tctgggggtc tcacatggcg
961 tctgcccctt gctccagcct gacaacagcc tgagaaatcc ccccgtaact tattatcact
1021 ttgggggttc gctgtgtcc ccgaacgtc ctgcacctc tgacgcagcc tgagaatgac
1081 ctgccctggc ccagcccta ctctgtgtaa tagaataaag gctgcgtgt gtctgtgtg
1141 agcgtgcgtc tgtgtgtcc tgtgtgcgag tctgagtcag agatttgag atgtctctgt
1201 gtgtttgtgt gtatctgtg gtcctcatcc tcatggggg ctacgccagg tctgtgaca
1261 ccccccttct gaatgaagcc ttctgacctg ggctggcact gctgggggtg aggacacatt
1321 gccccatgag acagtcaccag aacacggcag ctgctggctg tgacaatggt ttacacatcc
1381 ttagaccaag ggatgggacc tgatgacctg ggaggacctt tttagttctt acctctgtg
1441 gttctcaata aaacagaacg

FIG. 7B

Murine LAT Nucleotide Sequence (1-1260)

1 ggcacgagca ggcggggagc aagaaagggg caggtacagc tgggcacggg gatcgtgcag
 61 ctggtagctg gggcacgggc cccagctctg gctctggggc gaggaccttt ccagagccaa
 121 cactgctctc aactcagtc agcaagagag gggagccalc cagccccgaa aggatacggc
 181 tgcctactgc cgggcggatc ccaggctgga gcccgttgg tcccataccc ctgctgccac
 241 tctgtctcga ggggctgcag tgcagcaggg cctgtggcag gtgctctgca gatggaagca
 301 gacgccttga gcccgggtgg gctggggcctc ctgctctgc cttcttgggt cagctcctg
 361 gctgccctgt gcgtgcgctg ccgtgagttg ccagctcct atgacagcac tccacagag
 421 agttgtacc caagaagcat cctcatcaag ccacctcaaa taaccgtccc cgaacacct
 481 gctgttccct accctctagt cacttccctc ccacctcga ggcagccaga cctgtcctcc
 541 atcccagat cccacagcc ccttgggggt tccatcgga tgcctcttc ccagcagaat
 601 tcagatgatg ccaacagtgt ggcaagctac gagaaccagg agccagcctg taagaatgtg
 661 gatgcagatg aggalgaaga cgactatccc aacggctacc tagtgggtgt gcctgacagt
 721 agtccctgtg ccgtccctgt tgtctcctct gctcctgtgc ctageaacc tgccttggga
 781 gacagtgctt tctctgtgga gtctgtgaa gattacgtga atgttctga gagtgaggag
 841 agcgcagagg cgctctgga tgggagccgg gagtatgga atgtgtcccc agagcagcag
 901 ccagtaccca gggctgagct ggcctctgt aacccccagg aggtggaaga cgaaggagaa
 961 gaggaagggg tggatggaga ggaagctccc gactatgaga atctacagga gcttaactga
 1021 aagcctactg cagctgtctg tctgaaact ggacttgctg ggggtgtcgt aagaggatcc
 1081 catttgatct ctgccttggc acagcctgag aatctcccc taactattg tcactttggg
 1141 gtccagtctg tgtcccaat attctgtacc ttctgataaa gcctgagaat gaatctggtt
 1201 ccagccagac catgtcatgg aataaaggcc atgtgacata aaaaaaaaaa aaaaaaaaaa

FIG. 7C

human LAT	1	MEEAILVPCVLGLLLPIL.AMLMALCVHCHRLPGSYDSTSSDSLTPRGI	49
	 : : : : : : : : : : : :	
murine LAT	1	MEADALSPVGLGLLLPLFLVTLAALCVCRCRELPLVSYDSTSTESLTPRSI	50
	 : : : : : : : : : : : : :	
	50	QFKRPHTVAPWPPA..YPPVTSYPPPLSQPDLLPIPRSPQPLGGSHRTPSS	97
		: : : : : : : : : : : : : : : : : :	
	51	LIKPPQITVPRTPAVSYPLVTSFPPLRQPDLLPIPRSPQPLGGSHRMPSS	100
	 : : : : : : : : : : : : : :	
	98	RRDSGDANSVASIYENEEPACE..DADEDEDDYHNPGYLVVLPDSTPATST	145
		..: : : : : : : : : : : : : : : : : : :	
	101	QONSDDANSVASIYENQEPACKNVDADEDDYPN.GYLVVLPDSSPAAVP	149
	 : : : : : : : : : : : : : :	
	146	AAPSAPALSTPGIRDSAFSMESIDDYVNVPESGESAASLDGSRFYVNVVS	195
	 : : : : : : : : : : : : : :	
	150	VVSSAPVPSNPDLGDSAFSVESCEDYVNVPESEESAASLDGSRFYVNVVS	199
	 : : : : : : : : : : : : : :	
	196	QELHPGAAKTEPAALSSQEAEE.....VEEEGAPDYENLQELN	233
		. : : : : : : : : : : : : : : : : : : : : :	
	200	PEQQP.VTRAELASVNSQEEVEDEGEEEGVDGEEAPDYENLQELN	242

FIG. 7D

FIG. 8A-1	FIG. 8A-2
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FIG. 8A

1 ggaatagggtt agtttcagac aagcctgctt gccggagctc agcagacacc aggccuccg
61 ggcaggcctg gccaccctg ggcctcagag ctgctgctgg ggcattcaga accggctctc
121 catt ggcaft gggaccagag accccgcaag tggcctgttt gcctggacat ccacctgtac
181 gtccccaggt ttcgggagge ccaggggcca tgccagaccc cgcggcgcac ctgcccttct
241 tctacggcag catctcgcgt gccgaggccg aggagcacct gaagctggcg ggcattggcg
301 acgggctctt cctgctgcgc cagtgcctgc gctcgtggg cggctatgtg ctgtcgtcg
361 tgcacgatgt ggcgttccac cactttccca tcgagcgcca gctcaacggc acctacgcca
421 ttgccggcgg caaagcgcac tgtggaccgg cagagctctg cgagtctac tcgcgcgacc
481 ccgacggggt gccctgcaac ctgcgcaagc cgtgcaaccg gccgtcgggc ctgagccgc
541 agccgggggt ctgcactgc ctgcgagacg ccatggtgcg tgactacgtg cgcagacgt
601 ggaagctgga gggcgaggcc ctggagcagg ccatcatcag ccaggccccg caggtggaga
661 agtcattgc tacgacggcc cagagcgga tgccctggta ccacagcagc ctgacgcgtg
721 aggaggccga gcgcaaactt tactctgggg cgcagaccga cggcaagttc ctgctgagge
781 cgcggaagga gcagggcaca tacgccctgt cctcatcta tgggaagacg gtgtaccact
841 acctcatcag ccaagacaag gcgggcaagt actgcattcc cgagggcacc aagtttgaca
901 cgctctggca gctggtggag tatctgaagc tgaaggcgga cgggctcacc tactgcctga
961 aggaggcctg cccaacagc agtgccagca acgcctcagg ggctgctgct cccacactcc
1021 cagccccccc atccacgttg actcatctc agagacgaat cgacaccctc aactcagatg
1081 gataaccccc tgagccagca cgcataacgt cccagacaaa accgcggccg atgcccattg
1141 acacgagcgt gtatgagagc ccctacagcg acccagagga gctcaaggac aagaagctct
1201 tctgaagcg cgataacctc ctcatactg acattgaact tggctgcggc aactttg get
1261 cagtgcgcca gggcgtgtac cgcatgcga agaagcagat cgacgtggcc atcaaggtgc
1321 tgaagcaggg cacggagaag gcagacacgg aagagatgat gcgcgaggcg cagatcatgc
1381 accagctgga caaccctac atcgtgcggc tcattggcgt ctgccaggcc gaggcctca
1441 tgctggtcat ggagatggct gggggcgggc cgctgcacaa gttctggtc ggcaagaggg
1501 aggagatccc tgtgagcaat gtggccgagc tgctgcacea ggtgtccatg gggatgaagt
1561 acctggagga gaagaacttt gtgcaccgtg acctggcggc ccgcaacgtc ctgctggta
1621 accggcacta cgccaagatc agcgactttg gcctctccaa agcactgggt gccgacgaca
1681 gctactacac tgcccgtca gcagggaagt ggccgctcaa gtggtacgca cccgaatgca
1741 tcaactccg caagttctc agccgcagcg atgtctggag ctatggggtc accatgtggg
1801 aggccttgct ctacggccag aagccctaca agaagatgaa agggccggag gtcattggcct
1861 tcatcgagca gggcaagcgg atggagtgc caccagagtg tccaccgaa ctgtacgcac
1921 tcatgagtga ctgctggatc tacaagtggg aggatcgccc cgacttctg accgtggagc
1981 agcgcattgc agcctgttac tacagcctgg ccagcaaggt ggaaggggcc ccaggcgaca
2041 cacagaagge tgaggctgcc tgtgcctgag ctcccgtgc ccagggggagc cctccacgcc

2101 ggctcttccc caccctcagc cccaccccag gtctgcagt ctggctgagc cctgcttggt
2161 tgtctccaca cacagctggg ctgtggtagg ggggtgtctca ggccacaccg gccttgcat
2221 gcctgcctgg cccctgtcc tctctggctg gggagcaggg aggtccggga ggggtcggct
2281 gtgcagcctg tcttgggctg gtggctcccg gagggccctg agctgagggc attgcttaca
2341 cggatgcctt cccctgggcc ctgacattgg agcctgggca tcctcaggtg gtcaggcgta
2401 gatcaccaga ataaaccag ctccctctt gaaaaaaaaa aaaaaaaaaa aacc

Human ZAP-70 Nucleotide Sequence (1 ~2454)

FIG. 8A-2

1 mpdpaahlpf fygsisraea eehklagma dglflrqcl rslggyvlsl vddvrhfhfp
61 ierqlngtya iaggkahcgp aelcqfysqd pdglpcnlrn acnrppglep qpgvfdclrd
121 amvrdivrqt wklegdaleq aaisqapqve kliattaher mpwyhssltr eeaerklysg
181 qqtdgkflr prkeqgtyal slvygktvyh ylisqdkagk ycipegtkfd tlwqlveylk
241 lkadgliyrl kevcpnssas aavaaptlpa hpstftqpqr rvdtlnsdgy tpeparlass
301 tdkprpmpmd tsyvespysd peelkdkklf lkrenllvad ielgcgnfgs vrqgvymrk
361 kqidvaikvl kqgtekadkd ernmreaqimh qldnpyivrl igvcqaealm lvmemagggp
421 lhkflgkke ipvsnvaell hqvamgmky l eeknfvhrtl aamvllvnr hyakisdfgl
481 skalgaddsy ytarsagkwp lkwyapecin frkfssrsdv wsygvtnwea fsygqkpykk
541 mkgpevlfdi kqgkrmecpp ecppemyalm sdcwiykwed rpdfltveqr mrnyyyslas
601 raegppqceq vaeaacg

Human ZAP-70 Amino Acid Sequence (1 ~617)

FIG. 8B

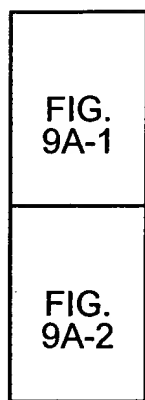


FIG. 9A

1 gaggaagagc cgcgggcccg gcggctgagg ccaccccggc ggcggtgga gagcgaggag
 61 gagcggtg ccccgcgctg cgcccgccct cgctcacct ggcgaggtg gacacctgcg
 121 t caggtgtgtg cctccggcc cctgaagcat ggccagcagc ggcatggctg acagcgccaa
 181 ccacctgccc ttcttttcg gcaacatcac ccgggaggag gcagaagatt acctggtcca
 241 ggggggcatg agtgatgggc ttatttgcg gcgccagagc cgcaactacc tgggtggctt
 301 cgccctgtcc gtggcccacg ggaggaaggc acaccactac accatcgagc gggagctgaa
 361 tggcacctac gccatgcgcg gtggcaggac ccattgccagc cccgccgacc tctgccacta
 421 ccactcccag gactctgatg gcctggtctg cctctcaag aagcccttca accggcccca
 481 aggggtgcag cccaagactg ggcccttga ggatttgaag gaaaacctca tcagggaata
 541 tgtgaagcag acatggaacc tgcagggtca ggctctggag caggccatca tcagtcagaa
 601 gcctcagctg gagaagctga tcgtaccac agcccatgaa aaaatgcctt ggttccatgg
 661 aaaaatctct cgggaagaat ctgagcaaat tgcctgata ggatcaaaga caaatggaaa
 721 gtctctgac cagccagag acaacaacgg ctctacgcc ctgtgcctgc tgcacgaagg
 781 gaaggtgtg cactatcgca tcgacaaaga caagacaggg aagctctcca tccccgaggg
 841 aaagaagtc gacacgtct ggcagctagt cgagcattat tctataaag cagatggtt
 901 gtaagagtt ctactgtcc catgtcaaaa aatcggcaca cagggaatg ttaatttgg
 961 aggccgtcca caacttcag gtcccatcc tgcgtctcc cctgccaag ggaaccggca
 1021 agagagtact gtgtcattca atccgtatga gccagaactt gcacctggg ctgcagaaa
 1081 agggcccccag agagaagccc taccatgga cacagaggtg tacgagagcc cctacgcgga
 1141 aggaggttta ccccgaggag atcaggccca cctggaccga aagctgtga cgctggaaga
 1201 ggctctgga caaagaactg attttggaac tgtgaaaaag ggctactacc aatgaaaaa
 1261 tgaaaatact gaaaaacgag agttgtgaaa accgtggctg gccaatgacc ccgtcttaa
 1321 agatgagtta ttagcagaag caaatgtcat gcagcagctg gacaaccgt acatcgtgcg
 1381 gatgatcggg atatgcgagg ccgagctctg gatgctggtt atggagatgg cagaactgg
 1441 aagtatttgc agcagaacag acatgtcaag tccctcaat gataagaaca tcatagaa
 1501 agcaattttg gttcatcag gttccatgg gcatgaagta cuggaggag tgcacagaga
 1561 tctggctgca agaatgtgt tgctagtac ccaacattac gccaatgca gtgatttcg
 1621 actttccaaa gcaatgcgtg ctgatgaaa ctactacaag gccagaccc atggaaagt
 1681 gcctgtcaag tggtagctc cggaatgcat caactactac aagttctcca gcaaaagcga

FIG. 9A-1



21/36

1741 tgtctggagc ttggagtgt tgatgtggga agcattctcc tatgggcaga agccatatcg
1801 agggatgaaa ggaagtgaag tcaccgctat gtagagaaa ggagagcgga tggggtgccc
1861 tgcagggtgt ccaagagaga tgtacgatct catgaatctg tgctggacat acgatgtgga
1921 aaacaggccc ggattcgag cagtggaaact gcggctgcgc aattactact atgacgtggt
1981 gaactaacg cccccacc tgcggtggc tgccttgat cacaggagca atcacaggaa
2041 aatgtatcca gaggaattga ttgcagcca cctccctctg ccagtcggga gagccaggct
2101 tggatggaac atgccacaa ctgtcaccc aaagcctgtc ccaggactca cctccacaa
2161 agcaaaggca gtccgggag aaaagacgga tggcaggatc caaggggcta gctggattg
2221 ttgttttct tgtctgtgtg atttcatac aggttattt tacgatctgt ttccaaatcc
2281 cttcatgtc ttccacttc tctgggtccc ggggtgcatt tgtactcat cgggcccagg
2341 gacattgcag agtggcctag agcacttca cccaagcgg cctttlccaa atgcccaagg
2401 atgccttagc atgtgactcc tgaagggaag gcaaaggcag aggaatttgg ctgcttctac
2461 ggccatgaga ctgatccctg gccactgaaa agctttctg acaataaaaa tgtttgagg
2521 ctttaaaaag aaaaaaaaaa a

Human Syk Kinase Nucleotide Sequence (1~2541)

FIG. 9A-2



22/36

1 massgmadsa nhlpfffgni treeaedylv qggmsdglyl lrqsrnylgg falsvahgrk
61 ahhytierel ngtyaiaggr thaspadlch yhsqesdglv clkkpfnrp qgvqpktgpf
121 edlkenlire yvqtwnlqg qaleqaiisq kpqlekliat tahekmppwfh gkisreeseq
181 ivligsktng kflirardnn gsyalcille gkvlhyridk dktgklsipe gkkfdtlwql
241 vehysykadg llrvltvpcq kigtqgnvnf ggrpqlpqsh passpaqgnr qestvsfnpy
301 epelapwaad kgpqrealpm dtevyespya dpeeirpkev yldrklille dkelgsgnfg
361 tvkkgyyqmk kvvktvavki lkneandpal kdellaeavn mqqldnpyiv rmigiceaes
421 wmlvmemael gplnkylqqn rhvkdniie lvhqvsimgmk yleesnfvr dlaarnvllv
481 tqhyakisdf glskalrade nyykaqthgk wpvkwyapac inyykfssks dvwsfgvlmw
541 eafsygqkpy rgmkgsevt mlekgermgc pagcpremyd lnnlcwtydv enrpgfaave
601 lrlmyyydv vn

Human Syk Kinase Amino Acid Sequence (1-612)

FIG. 9B

1 gccagtgaat tggggggctc agccctcttc cctcccttcc cctgcttca ggctgctgag
61 cactgagcag cgctcagaat ggaagccatc gccaaatatg acttcaaagc tactgcagac
121 gacgagctga gcttcaaaag gggggacatc ctcaagggtt tgaacgaaga atgtgatcag
181 aactgggtaca aggcagagct taatggaaaa gacggcttca ttccaagaa ctacatagaa
241 atgaaaccac atccgtgggt ttttggcaaa atccccagag ccaaggcaga agaaatgctt
301 agcaaacagc ggcacgatgg ggcctttctt atccgagaga gtgagagcgc tctggggac
361 ttctccctct ctgtcaagtt tggaaacgat gtgcagcact tcaagggtgt ccgagatgga
421 gccgggaagt acttctcttg ggtgggtgaag ttcaattctt tgaatgagct ggtggattat
481 cacagatcta caictgtctc cagaaaccag cagatattcc tgcgggacat agaacaggtg
541 ccacagcagc cgacatacgt ccaggccctc ttgactttg atccccagga ggaaggagag
601 ctgggcttcc gccggggaga ttatccat gtcattgata actcagacc caactgggtg
661 aaaggagctt gccacgggca gaccggcatg ttccccgca attatgtcac cccgtgaac
721 cggaacgtct aagagtcaag aagcaattat taaagaaag tgaataatgt aaaacacata
781 caaagaatt aaaccacaa gctgcctctg acagcagcct gtgaggagggt gcagaacacc
841 tggccgggtc accctgtgac cctctcactt tgggtggaac tttaggggggt gggagggggc
901 gttggattta aaaatgccaa aacttacctt taaattaaga agagttttta ttacaaattt
961 tcactgtctc tctctttcc cctcctttgt cttttttt atccttttt ctctctgtc
1021 catcagtga tgacgtttta ggccacgtat agtcctagct gacgccaata ataaaaaaca
1081 agaaaccaa aaaaaaaac ccgaattca

Human Grb Nucleotide Sequence (1-1109)

FIG. 10A

1 meaiakydfk ataddelsfk rgdilkvlne ecdqnwykae lngkdgfipk nyiemkphpw
61 ffgkipraka eemlskqrhd gafilreses apgdfslsvk fgndvqhfkv lrdgagkyfl
121 wvkvfnsln lvdyhrstsv srnqqiflrd ieqvpqqpty vqaldfdpq edgelgfrg
181 dfihvmdnsd pnwwkgachg qtgmfprnyv tpvnmv

Human Grb Amino Acid Sequence (1-217)

FIG. 10B

OCT 0 8 2002

1 ctaggctttt gcaaaaagct tcacgtgcc gcaagcactc agggcgcaag ggctgctaaa 24/36
61 ggaagcggaa cacgtagaaa gccagtccgc agaaacggtg ctgaccccgg atgaatgtca
121 gctactgggc tatctggaca agggaaaacg caagcgcaaa gagaaagcag ttctgtgcc
181 ttaagaacat tagaaccttc ctgtccacct gctgtgagaa gttcggcctc aagcggagcg
241 agctcttga agcctttgac ctcttcgatg tgcaggattt tggcaaggtc atctacaccc
301 tgtctgctct gtctggacc ccgatgccc agaacagggg gatcatgccc tccccaccg
361 aggaggagag ttaggtgat gaagacatct acagtggcct gtccgaccag atcgacgaca
421 cgggtggagga ggatgaggac ctgtatgact gcgtggagaa tgaggaggcg gaaggcgacg
481 agatctatga ggacctcatg cgctcggagc ccgtgtccat gccgccaag atgacagagt
541 atgacaagcg ctgctgctgc ctgcgggaga tccagcagac ggaggagaag tacactgaca
601 cgctgggctc catccagcag cattcttga agcccctgca acggttctg aaacctcaag
661 acattgagat catctttatc aacattgagg acctgcttcg tgttcatact cacttctaa
721 aggagatgaa ggaagccctg ggcacccctg gcgcaccgaa tctctaccag gtcttcatca
781 aatacaagga gaggttctc gtctatggcc gctactgcag ccaggtggag tcagccagca
841 aacacctgga ccgtgtggcc gcagcccgagg aggcgtgca gatgaagctg gaggaatgtt
901 ctcagagagc caacaacggg aggttactg cgcgacctgc tgatggtgcc tatgcagcga
961 gntcaaat atcacctct tctccaggag ctggtgaaac acacgcagga ggcgatggag
1021 caaggaaact gcggtggcc ctggatgcea tgagggacct ggctcagtgc gtgaacgagg
1081 tcaagcgaga caacgagaca ctgcgacaga tcaccaattt ccagctgtcc attgagaacc
1141 tggaccagtc tctggctcac tatggccggc ccaagatcga cggggaactc aagatcacct
1201 cggtggaacg gcgctccaag atggacaggt atgccttctt gctcgacaaa gctctactca
1261 tctgtaagcg caggggagac tctatgacc tcaaggactt tgtaaacctg cacagcttcc
1321 aggttcggga tgactcttca ggagaccgag acaacaagaa gtggagccac atgttctcc
1381 tgatcgagga ccaaggtgcc cagggtatg agctgttctt caagacaaga gaattgaaga
1441 agaagtggat ggagcagttt gagatggcca tctccaacat ctatccggag aatgccaccg
1501 ccaacgggca tgacttccag atgttctctt tgaggagac cacatctgc aaggcctgtc
1561 agatgctgct tagaggtacc ttctatcagg gctaccgctg ccatcgggtc cgggcatctg
1621 cacacaagga gtgtctgggg agggctcctc catgtggccg acatgggcaa gatttcccag
1681 gaactatgaa gaaggacaaa ctacatcgca gggctcagga caaaaagagg aatgagctgg
1741 gtctgcccga gatggaggtg ttccaggaat actacgggct tctccaccc cctggagcca
1801 ttggaccctt tctacggctc aacctggag acattgtgga gtcacgaag gctgaggctg
1861 aacagaactg gtgggagggc agaaatacat ctactaatga aattggctgg ttctcttga
1921 acagggtgaa gccctatgtc catggccctc ctcaggacct gtctgttcat ctctggtacg
1981 caggcccat ggagcgggca ggggcagaga gcacctggc caaccgctc gacgggactt
2041 tcttggtgcg gcagagggtg aaggatgcag cagaattgc catcagcatt aaatataacg
2101 tcgaggtcaa gcacacggtt aaaatcatga cagcagaagg actgtaccgg atcacagaga
2161 aaaaggctt cggggggtt acggagctgg tggagtta ccagcagaac tctctaaagg
2221 attgttcaa gtctctggac accacctgc agttccctt caaggagcct gaaaagagaa
2281 ccatcagcag gccagcagtg ggaagcaca agtatttgg cacagccaaa gcccgtatg
2341 acttctgcgc ccgtgaccgt tcagagctgt cgctcaagga gggtgacatc atcaagatcc
2401 ttaacaagaa gggacagcaa ggctggtggc gaggggagat ctatggccgg gttggctggt
2461 tccctgccaa ctacgtggag gaagattatt ctgaatactg ctgagccctg gtgccttggc
2521 agagagacga gaaactccag gctctgagcc cggcgtggcg aggcagcggc ccaggggctg
2581 tgacagctcc ggcgggtgga gactttggga tggactggag gagggcagcg tccagctggc
2641 ggtgctcccg ggatgtgccc tgacatggtt aatttataac accccgattt tctcttggg
2701 tccctcaag cagacggggg ctcaaggggg ttacatttaa taaaaggatg aagatgg

Human Vav Nucleotide Sequence (L-2757) FIG. 11A



25/36

1 mnvsywaiwl renasarkkq flclknirif lstceekfgl krsel feafd lfdvqdfgkv
61 iytlsalswt piaqnr gimp fpteesvgd ediysglsdq iddtveeded lydcveneea
121 egdeiyedlm rsepvsmpk mteydkrccc lreiqqteek ytdtlgsiqq hflkplqrfl
181 kpqdieiifi niedllrvht hflkemkeal gtpgapnlyq vfikykerfl vygrycsqve
241 saskhldrva aaredvqmkl eecsqrann g rftarpadga yaassqispp spgagethag
301 gdgarklrla ldamrdlaqc vnevkrdnet lrqitnfqls ienldqslah ygrpkidgel
361 kitsverrsk mdryafil dk allickrrgd sydlkdfvnl hsfqvrddss gdrdnkkwsh
421 mflhiedqga qgyelffktr elkkkwmeqf emaisniype natanghdfq mfsfeettsc
481 kacqmlrgrt fyqgyrchrcrasahkeclg rvppcgrhgq dfpgtmkkdk lhrraqdkkr
541 nelglpkrnev fqeyyglppp pgaigpflrl npgdivel tk aaeqnwweg rntstneigw
601 fpcnrvkpyv hgppqdlsvh lwyagprnera gaesilanrs dg tflvrqrv kdaaefaisi
661 kynvevkhtv kimtaeglyr itekkafrgl telfefyqqn slkdcfksld ttlqfpfkep
721 ekrtisrpav gstkyfgtak arydfcardr selslkegdi ikilnkkqq gwwrgeiygr
781 vgwfpanyve edyseyc

Human Vav Amino Acid Sequence (1~797)

FIG. 11B

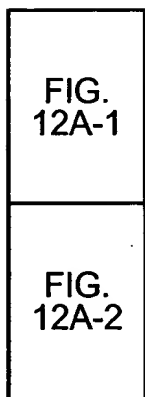


FIG. 12A

1 gaattccggg cccgtagc cggcggcggc ggccggcggc gcggcggcgg cggccgggag
61 aggccctcc ucagccct gcttctctcc ctgctcgca gtcgagccga gccggcggac
121 ccgcctgggc tccgacctg cccaggccat ggccggcaac gtgaagaaga gctctggggc
181 cggggggcggc acggggtccg gggggtcggg ttcgggtggc ctgattgggc tcatgaagga
241 cgccttcag ccgcaccacc accaccacca ccacctcagc cccaccgcg cggggacggt
301 ggacaagaag atggtggaga agtgcaggaa gctcatggac aagtggtgc ggttgtgtca
361 gaacccaaag ctggcgctaa agaatagccc acctatata ttagacctgc taccagatac
421 ctaccagcat ctccgtacta tctgtcaag atatgagggg aagatggaga cacttgga
481 aatgagtat tuagggtgt ttatggagaa ttgatgaag aaaactaagcaaccataag
541 cctcttcaag gagggaaaag aaagaatgta tgaggagaat tctcagccta ggcgaaacct
601 aaccaaactg tccctcatct tcagccacat gctggcagaa ctaaaggaa tcttccaag
661 tggactcttt caggagaca cattcggat tactaaagca gatgctgcgg aatttgag
721 aaaagctttt ggggaaaaga caatagtcct ttggaagagc mcgacagg ctctacatga
781 agtgcacccc atcagttctg ggctggaggc catggctctg aaatccacta ttgatctgac
841 ctgcaatgat tatamcgg ttttgaatt tgacatcttt acccgactct ttagccctg
901 gtectctttg ctcaggaatt ggaacagcct tgctgtaact catcctggct acatggcttt
961 ttgacgtat gacgaagtga aagctcggct ccagaaattc attcacaac ctggcagtta

FIG. 12A-1



1021 tatnccgg ctgagctgta ctctctggg tcagtgggct attgggtatg ttactgctga
1081 tgggaacatt ctccagacaa tccctcacia taaacctctc ttccaagcac tgattgatgg
1141 cttcagggaa ggcttctatt tgttctctga tggacgaaat cagaatcctg atctgactgg
1201 cttatgtgaa ccaactcccc aagaccatat caaagtgacc caggaacaat atgaattata
1261 ctgtgagatg ggctccacat tccaactatg taaaatatgt gctgaaaatg ataaggatgt
1321 aaagattgag ccctgtggac acctcatgtg cacatcctgt cttacatcct ggcaggaatc
1381 agaaggtcag ggctgtcctt tctgccgatg tgaaattaaa ggtactgaac ccacgtgtgt
1441 agatccgttt gatcctagag ggagtggcag cctgttgagg caaggagcag agggagctcc
1501 ctcccaaat tatgatgatg atgatgatga acgagctgat gatactctct tcatgatgaa
1561 ggaattggct ggtgccaagg tggaaaggcc gccttctcca ttctcatgg cccacaagc
1621 ttccctccc ccggtgccac cagcacttga cctctgccg cagcagatgt gtgtccctc
1681 aagtgttct gctcttgaa ctgcttctaa ggctgttct ggctccctc ataaagacaa
1741 accattgcca gtacctcca cacttcgaga tctccacca ccaccgcctc cagaccggcc
1801 atattctgtt ggagcagaat cccgacctca aagacgcccc ttgccttgta caccaggcga
1861 ctgtccctcc agagacaaac tgccccctgt cccctctagc cgccttgagg actcatggct
1921 gccccggcca atcccaaaag taccagtatc tgcccaagt tccagtgatc cctggacagg
1981 aagagaatta accaaccggc actcacttcc atttctattg cctcacaata tggagcccag
2041 accagatgtg cctaggctcg gaagcacgtt cagtctggat acctccatga gtatgaatag
2101 cagcccatta gtaggtccag agtgtgacca ccccaaaatc aaaccttct catctgccaa
2161 tgccatttat tctctggctg ccagacctct tctgtgcca aaactgccac ctggggagca
2221 atgtgagggt gaagaggaca cagagtacat gactccctct tccaggcctc tacggccttt
2281 ggatacatcc cagagttcac gagcatgtga ttgcgaccag cagattgata gctgtacgta
2341 tgaagcaatg tataatattc agtcccaggc gccatctatc accgagagca gcaccttgg
2401 tgaagggaat ttggccgcag cccatgccaa cactgggtccc gaggagtcag aaaatgagga
2461 tgatgggtat gatgtcccaa agccacctgt gccggccgtg ctggcccgcc gaactctctc
2521 agatatctct aatgccagct cctccttgg ctggtgtct ctggatggtg atcctacaac
2581 aaatgtcact gaagggtccc aagttccga gaggcctcca aaaccattcc cgcggagaat
2641 caactctgaa cggaaagctg gcagctgtca gcaaggtagt ggtcctgccg cctctgctgc
2701 caccgcctca cctcagctct ccagtgaat cgagaacctc atgagtcagg ggtactccta
2761 ccaggacatc cagaaagctt tggcattgc ccagaacaac atcgagatgg ccaaaaacat
2821 cctccgggaa ttgtttcca ttcttctcc tgcccatgta gctacctagc acaccatctc
2881 cctgctgcag gtttagagga ccagtgaat gggagttatt actcaagtgg cacctagaag
2941 ggcaggagtt crrttggtga cttcacagt aagtcttggc ctctctgtgg gatacacat
3001 cagtgggtcc aagatttcaa agtggtgaaa tgaaaatgga gcagctagta tgtttatta
3061 tttatgggt cttgagtga tttgaagggt

Human cbl Nucleotide Sequence (1~3090)



1 rnagnvkkssg aggggsggsg aggliglmkd afqphhhhhh lsphppctvd kkmvekcwkl
61 rndkvvrhcqn pnvalknsp yildllpdy qhlrtvlsry egkrnetlgen eyfrvfmnl
121 mkktkqtisl fkegkermeye ensqrrnlt klslifshml aelkgifpsg lfqgdtfrit
181 kadaaefwrk afgektivpw ksfrqalhev hpissgleam alkstidltc ndyisvfejd
241 iftrlfqpws slrnwnsla vthpgymafl tydevkarlq kfihkpgsyi frlsctrlgq
301 waigyvtadg nilqtiphmk plfqalidgf regfylfpdg rnqnpdltgl ceptpqdhik
361 vtqicaendk dvkiepcghl mctscitswq esegqgcpfc rceikgtepi vvdpdfprgs
421 gsllrqgaeg apspnydddd deraddslfm mkelagakve rpsspfsmap qaslppvppr
481 ldllqrapv pastsvlgta skaasgslhk dkplpipptl rdlppppppd rpysvgaetr
541 pqrplpctp gdcpsrdklp pvpssrpgds wlsrtipkvp vatpnpgdpw ngreltnrhs
601 lpfslpsqme pradvprlgs tfsldtsmtm nsspvagpes ehpkikpsss anaiyslaar
661 plpmpklppg eqgeseedte ymtptsrpvg vqkpepkrpl eatqssracd cdqqidscty
721 earnytiqsqa lsvaensasg egnlatahts tgpeesened dgydvpkppv pavlarrits
781 disnasssfg wlsldgdpth fnegsqvper ppkpfprrin serkassyqq gggatanpva
841 tapspqlsse ierlmsqgys yqdiqkalvi ahnniemakn ilrefvsiss pahvat

FIG. 12B

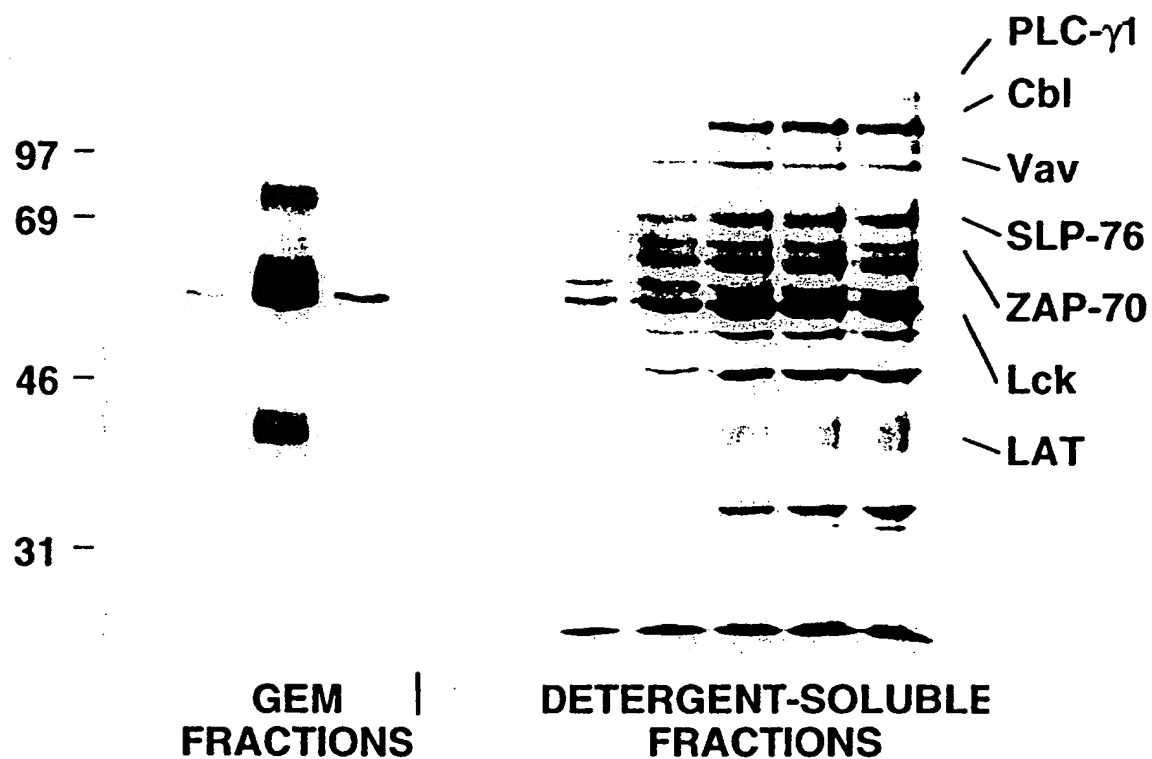


FIG. 13A

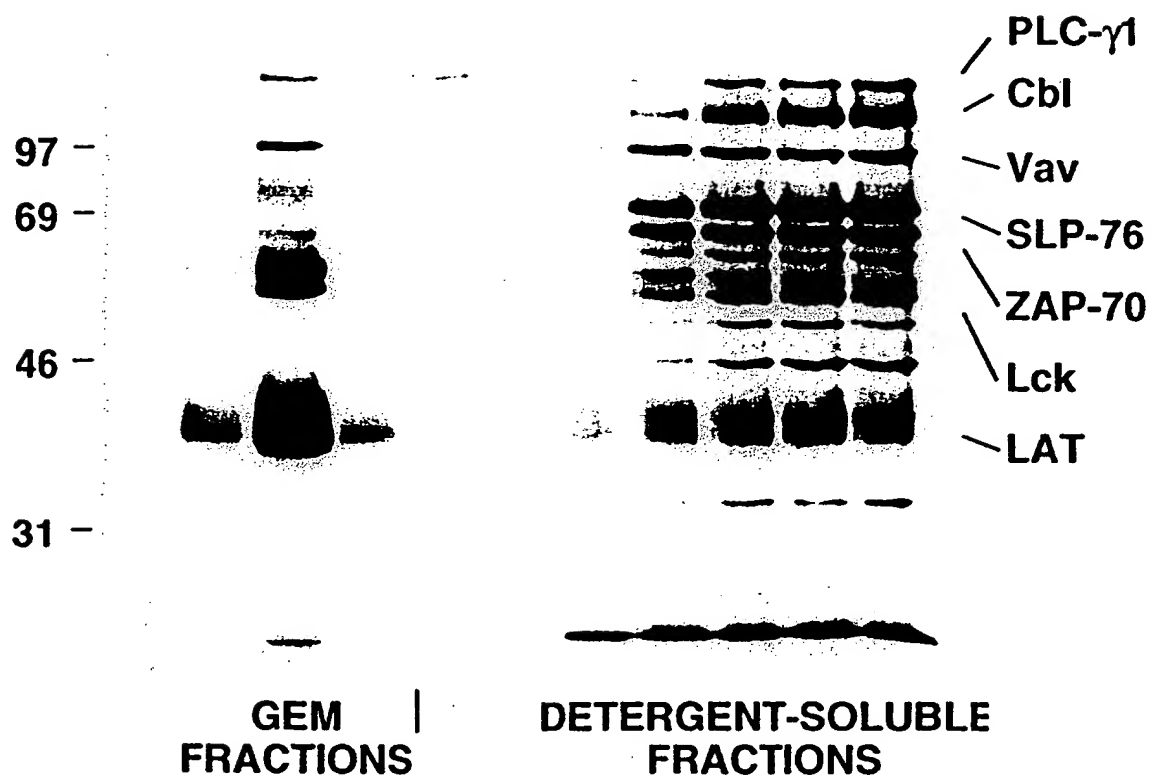


FIG. 13B

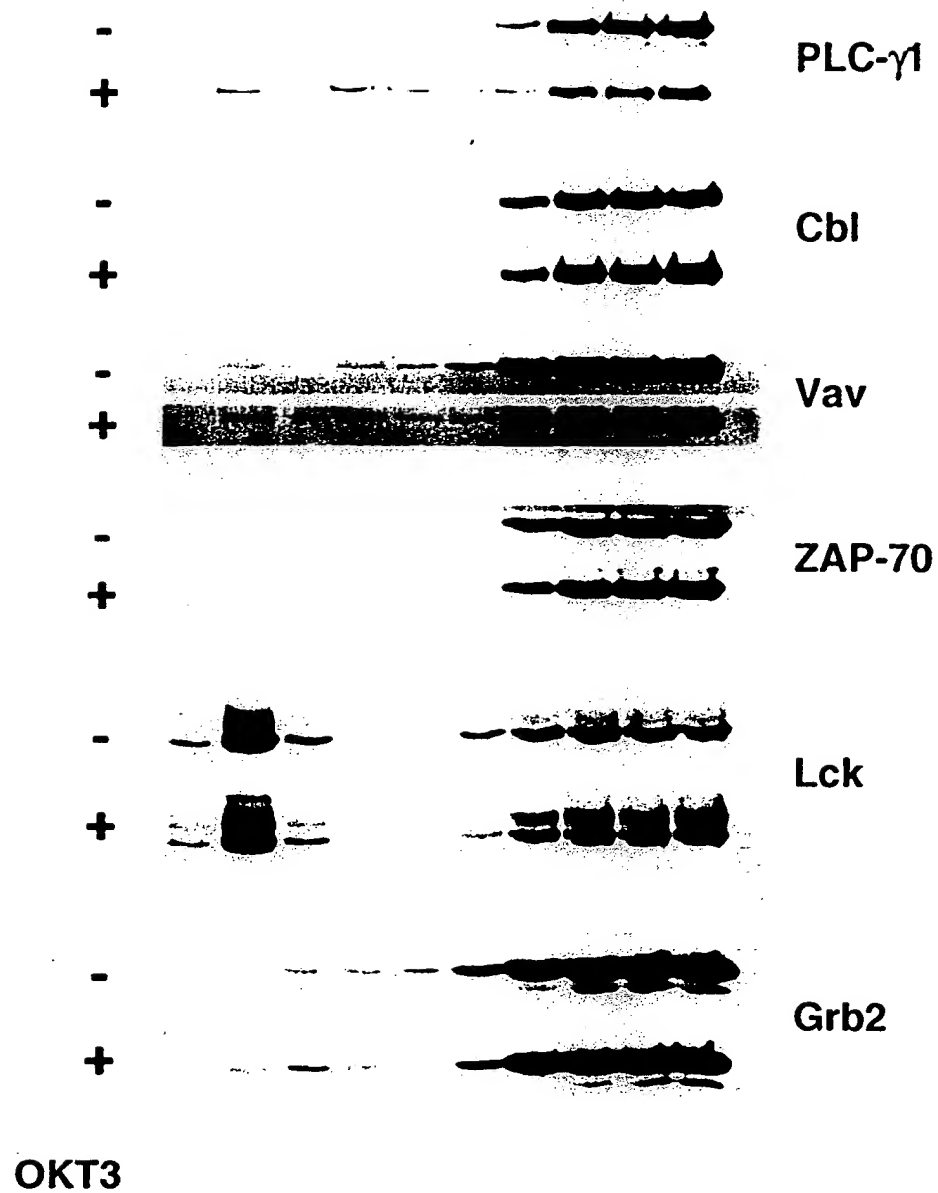


FIG. 13C

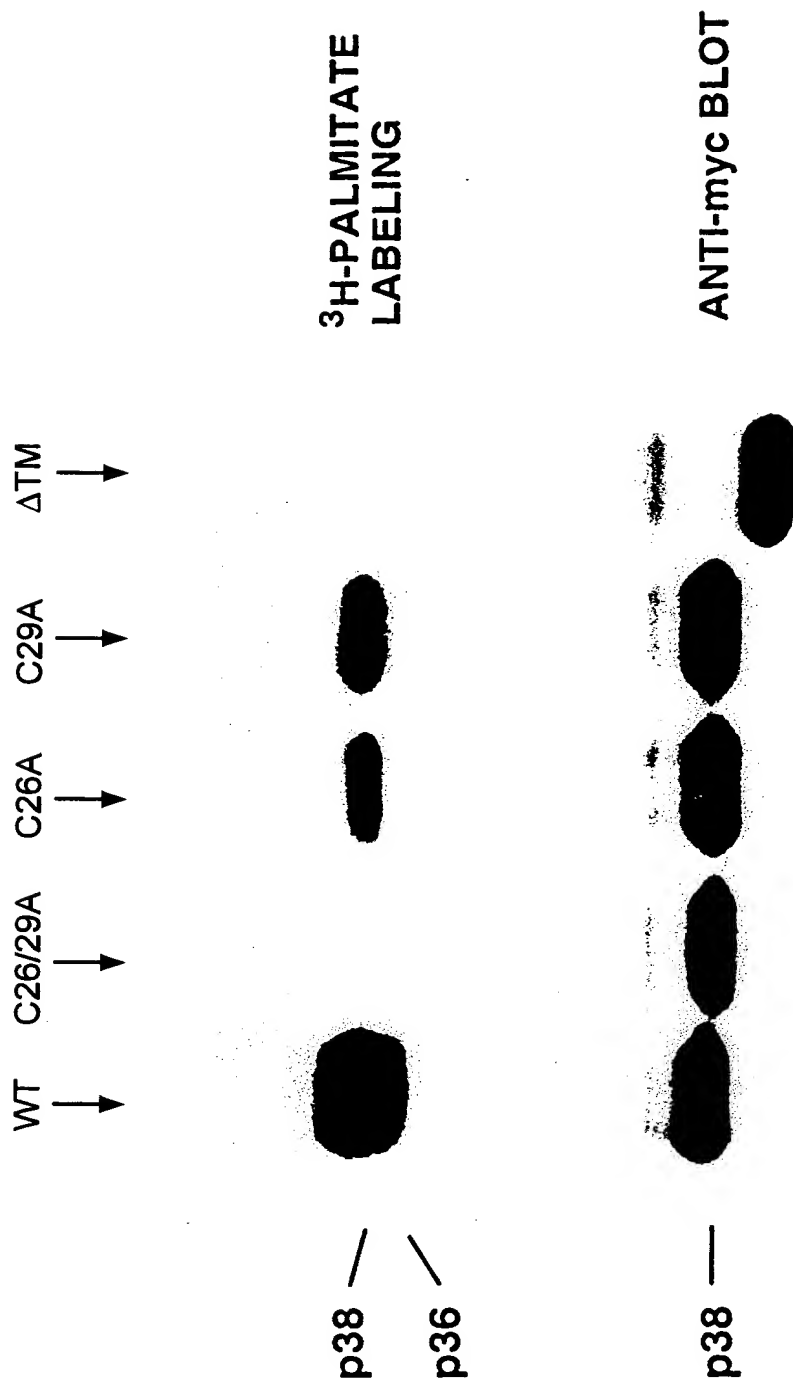


FIG. 14

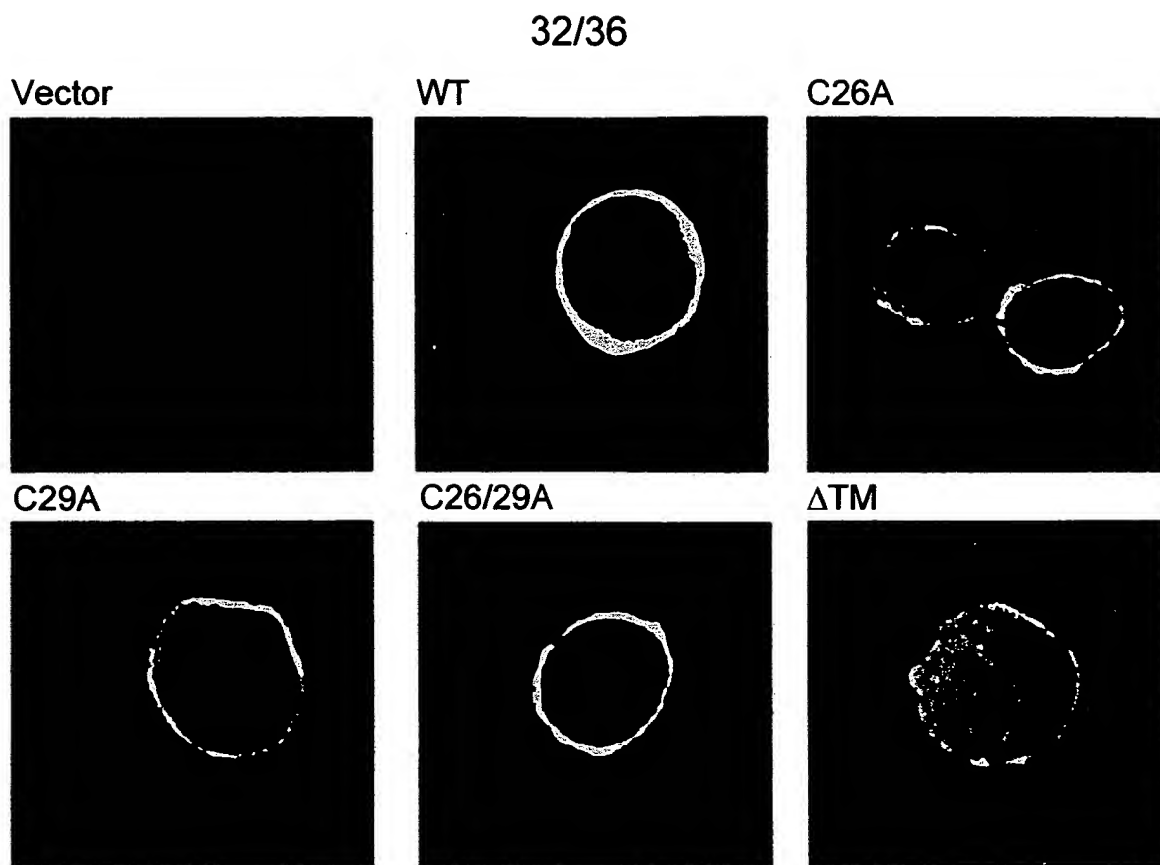


FIG. 15A

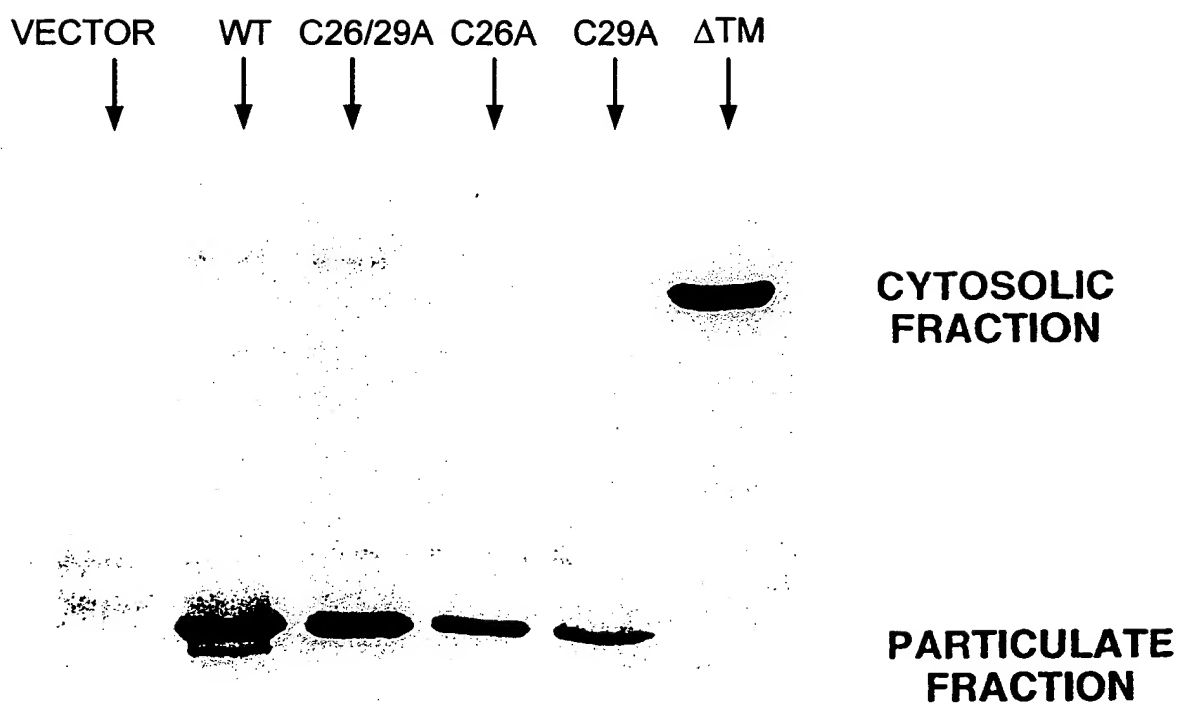


FIG. 15B

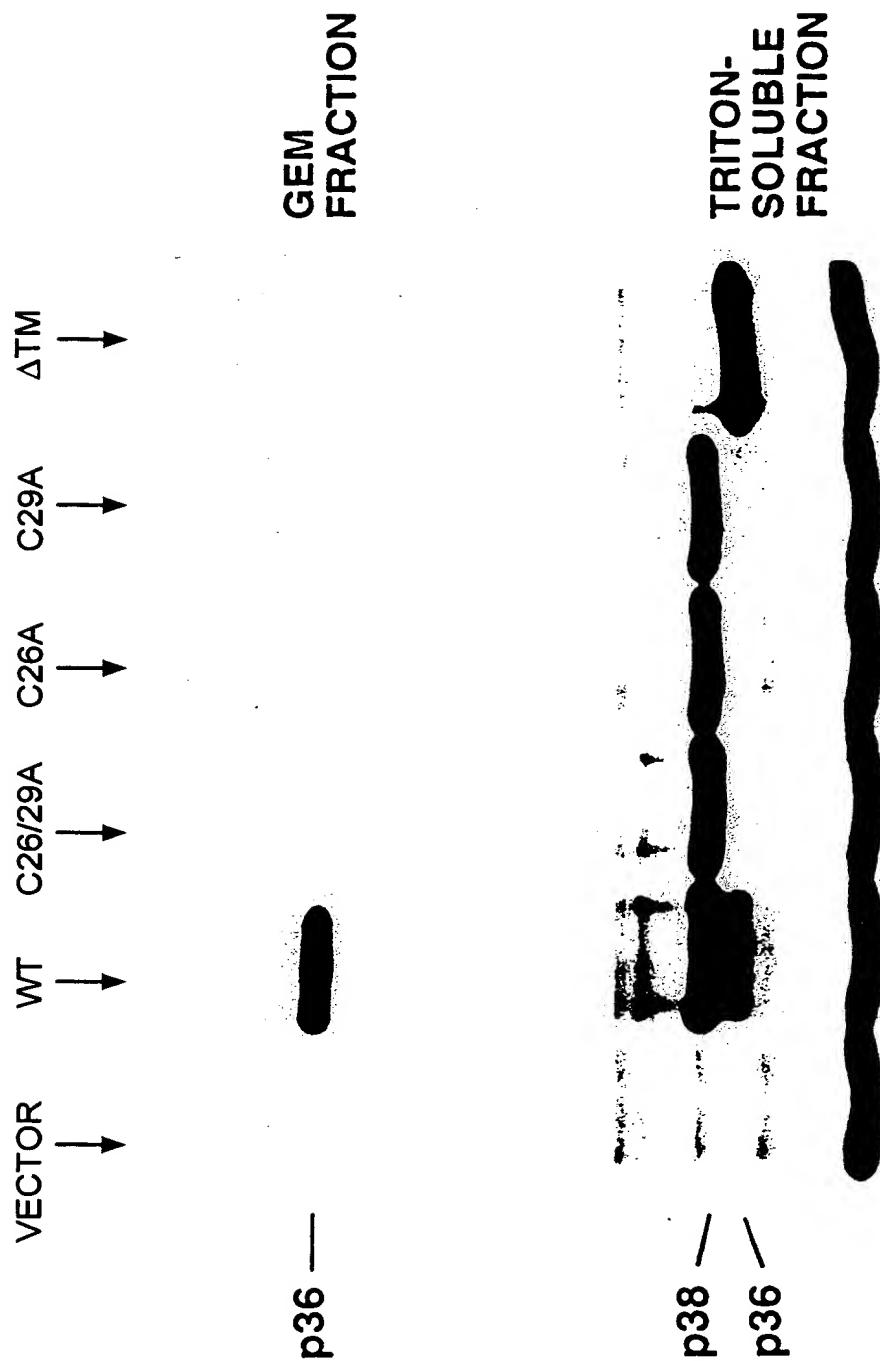


FIG. 15C

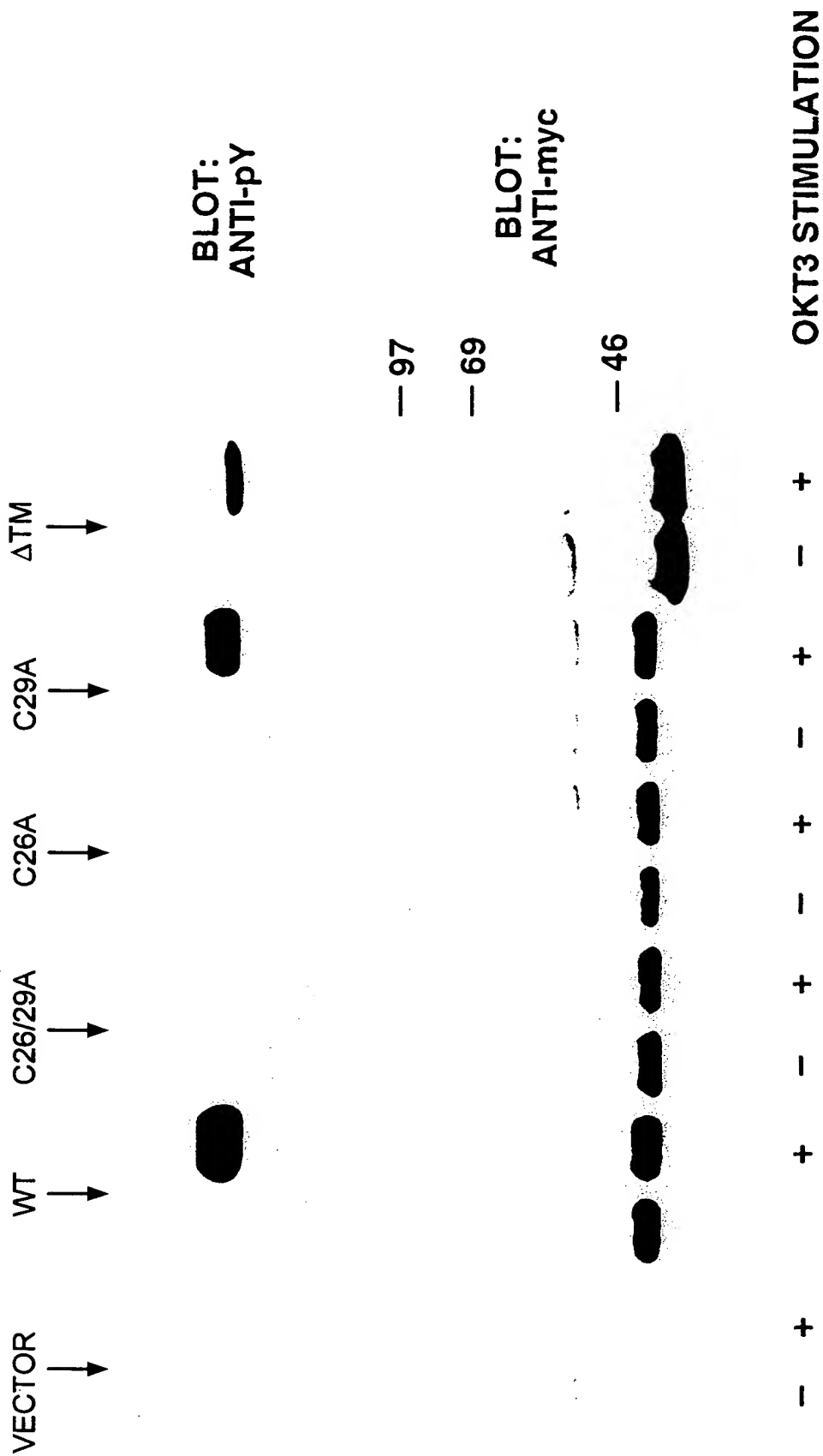


FIG. 16

LAT is a central molecule that links the TCR to cellular activation

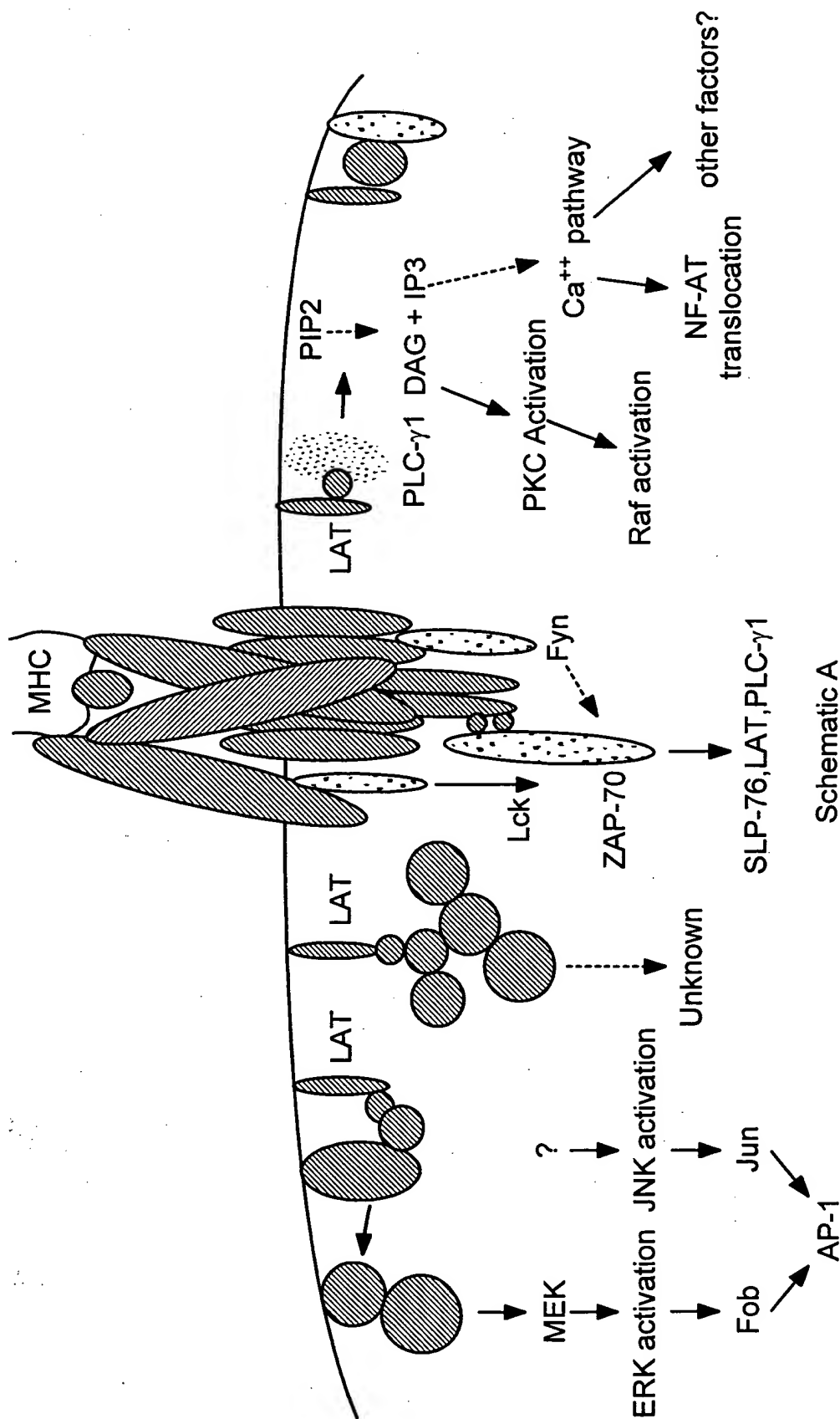


FIG. 17

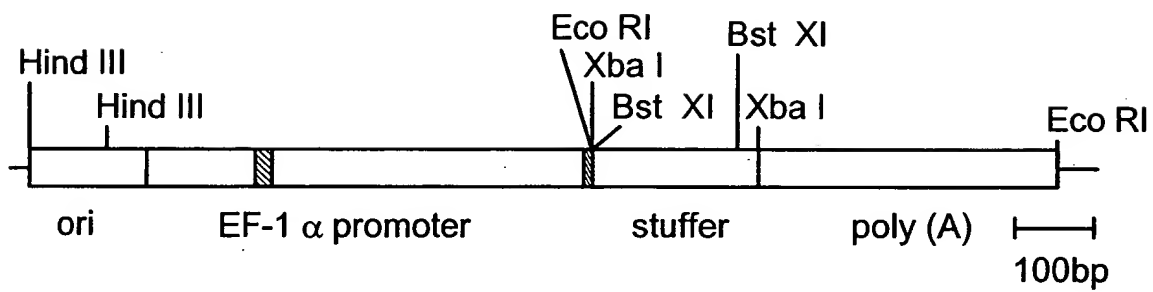


FIG. 18